



Complete Summary

GUIDELINE TITLE

Screening for elevated blood lead levels in children.

BIBLIOGRAPHIC SOURCE(S)

Lane WG, Kemper AR. American College of Preventive Medicine Practice Policy Statement. Screening for elevated blood lead levels in children. Am J Prev Med 2001 Jan; 20(1): 78-82. [40 references]

COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis

RECOMMENDATIONS

EVIDENCE SUPPORTING THE RECOMMENDATIONS

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Lead poisoning (blood lead levels of greater than or equal to 10 micrograms/dL)

GUIDELINE CATEGORY

Evaluation

Prevention

Risk Assessment

Screening

Treatment

CLINICAL SPECIALTY

Family Practice

Internal Medicine

Pediatrics

Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Nurses
Physician Assistants
Physicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

To present a practice policy statement on screening for elevated blood lead levels in children

TARGET POPULATION

Screening by venous or capillary blood lead testing:
Children aged 1 year who are identified as being at high risk for elevated blood levels (e.g., receive Medicaid or Supplemental Food Program for Women, Infants, and Children [WIC], live in a community with $\geq 12\%$ prevalence of blood lead levels at ≥ 10 mcg/dL, live in a community with $\geq 27\%$ of homes built before 1950, or meet one or more high-risk criteria of a lead-screening questionnaire)

Risk assessment for lead exposure
Children 6 years old and younger, especially those at increase risk of exposure to lead

INTERVENTIONS AND PRACTICES CONSIDERED

Screening

1. Risk factor assessment (e.g., questionnaires)
2. Venous or capillary blood lead levels

Treatment/management according to blood lead levels

1. Parental education to decrease lead exposure and to decrease lead absorption
2. Complete medical history, including an environmental evaluation and nutrition assessment, and physical exam
3. Detailed environmental investigation with lead hazard reduction and appropriate referrals
4. Chelation therapy
5. Nutrition interventions

MAJOR OUTCOMES CONSIDERED

- Blood lead levels
- Incidence of lead poisoning
- Sensitivity of screening instruments
- Accuracy of lead screening tests
- Cognitive function
- Morbidity due to elevated blood levels
- Cost-effectiveness of lead screening

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed a MEDLINE search and used the reference lists from key articles to collect evidence.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Subjective Review

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A recent cost-effectiveness analysis of lead screening among 1-year-old children found that the cost of universal lead screening exceeded the benefits when the prevalence of elevated lead levels in a community was below 14% (range 11% to 17%). The authors used a societal perspective and conducted a sensitivity analysis using the best- and worst-case scenarios of the effects of education,

environmental management, and chelation therapy. However, the study did not account for the costs of determining the initial prevalence of elevated lead levels within a community. Another recent study found that targeted screening incurred both lower costs per child and lower costs per case as compared to universal screening in low- ($\leq 5.9\%$ elevated lead levels) and medium- (6% to 12% elevated lead levels) prevalence communities. Previous studies have shown that even when universal screening was recommended by the CDC, only 27% to 53% of providers complied with universal screening recommendations, and many providers did not believe that universal screening was necessary among their patient population. Furthermore, sufficient laboratories to provide for universal blood lead screening do not currently exist in the United States.

METHOD OF GUIDELINE VALIDATION

Comparison with Guidelines from Other Groups
Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Guidelines/recommendations from the following groups were reviewed:

- Centers for Disease Control and Prevention (CDC)
- American Academy of Pediatrics
- U.S. Preventive Services Task Force
- Canadian Task Force on the Periodic Health Examination
- American Academy of Family Physicians

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Screening for elevated lead levels via venous or capillary blood lead testing should be conducted for children aged 1 year only if they are identified as being at high risk for elevated blood lead levels. Criteria for being at high risk include: receipt of Medicaid or Supplemental Food Program for Women, Infants, and Children (WIC), living in a community with $\geq 12\%$ prevalence of blood lead levels at ≥ 10 mcg/dL, living in a community with $\geq 27\%$ of homes built before 1950, or meeting one or more high-risk criteria of a lead-screening questionnaire. This questionnaire should include both questions suggested by the Centers for Disease Control and Prevention in its 1997 guidelines, as well as questions developed for and tailored to specific communities (See Table 2, below). These questions may pertain to use of home remedies and cosmetics, country of origin, and/or behavioral risk factors. Risk assessment for lead exposure should be performed beginning during prenatal visits and continuing until 6 years of age. (Centers for Disease Control and Prevention [CDC], 1997; U.S. Public Health Service, 1998)

Further research is needed to assess the effectiveness of interventions to reduce blood lead levels. Research should be conducted to better elucidate the cognitive effects of chelation therapy, and to evaluate the effectiveness of newer abatement technologies on both blood lead levels and neurocognitive outcomes. More research is also needed to assess the effectiveness of nutrition interventions in

children, and of parental education to remove lead from the home. Risk factor assessment tools such as questionnaires should be better evaluated as well, in order to better elucidate their reliability, sensitivity, specificity, and generalizability.

All laboratories that test blood lead levels should participate in blood lead proficiency testing programs such as the collaborative program between the Centers for Disease Control and Prevention and Health Resources and Services Administration. Primary prevention strategies, such as progress toward increased lead-safe housing should be continued and encouraged. Recommendations for specific interventions beyond what is indicated in Table 1 (from the original guideline document), below, are beyond the scope of this statement.

Table 1: Recommended Follow-up Services According to Blood Lead Level (BLL)

Blood Lead Level (mcg/dL)/Action

<10

- No action required

10-14

- Obtain a confirmatory venous blood lead level within 1 month; if still within this range, provide education to decrease blood lead exposure.
- Repeat blood lead level test within 3 months.

15-19

- Obtain a confirmatory venous blood lead level within 1 month; if still within this range, take a careful environmental history.
- Provide education to decrease blood lead exposure and to decrease lead absorption.
- Repeat blood lead level within 2 months.

20-44

- Obtain a confirmatory venous blood lead level within 1 week; if still within this range, conduct a complete medical history (including an environmental evaluation and nutrition assessment) and physical exam.
- Provide education to decrease blood lead exposure and to decrease lead absorption.
- Either refer the patient to the local health department or provide case management that should include a detailed environmental investigation with lead hazard reduction and appropriate referrals for support services.
- If blood lead level is >25 mcg/dL, consider chelation (not currently recommended for blood lead levels <45 mcg/dL), after consultation with clinicians experienced in lead toxicity treatment.

45-69

- Obtain a confirmatory venous blood lead level within 2 days; if still within this range, conduct a complete medical history (including an environmental evaluation and nutrition assessment) and physical exam.
- Provide education to decrease blood lead exposure and to decrease lead absorption.
- Either refer the patient to the local health department or provide case management that should include a detailed environmental investigation with lead hazard reduction and appropriate referrals for support services.
- Begin chelation therapy in consultation with clinicians experienced in lead toxicity therapy.

≥70

- Hospitalize the patient and begin medical treatment immediately in consultation with clinicians experienced in lead toxicity therapy.
- Obtain a confirmatory blood lead level immediately.
- The rest of the management should be as noted for management of children with blood lead levels between 45 and 69.

Table 2: 1997 Centers for Disease Control and Prevention Basic Personal Risk Questionnaire for Lead Exposure*

1. Does your child live in or regularly visit a house that was built before 1950? This question could apply to a facility such as a home daycare center or the home of a babysitter or relative.
2. Does your child live in or regularly visit a house built before 1978 with recent or ongoing renovations or remodeling (within the last 6 months)?
3. Does your child have a sibling or playmate who has or did have lead poisoning?

Screen all children whose parent/guardian responds, "yes" or "don't know" to any question.

*The 1991 Centers for Disease Control and Prevention Basic Personal Risk Questionnaire for Lead Exposure included the above three questions in addition to the following two questions:

1. Does your child live with an adult whose job or hobby involves exposure to lead?
2. Does your child live near an industry that is likely to release lead (such as a battery plant, lead smelter, or manufacturing plant where lead may be used)?

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Exposure to lead may have significant health effects on children. Acutely, lead has been shown to significantly affect the renal, neurologic, gastrointestinal, and hematopoietic systems causing anemia, colic, nephropathy, encephalopathy, and death. Chronic low-level exposure may result in cognitive and behavioral changes and learning disabilities. Costs for inpatient treatment alone of children aged under 5 years totaled over \$8 million per year from 1988 to 1992.
- Earlier detection of elevated lead levels may lead to earlier initiation of treatment. Identification of elevated lead levels in high-risk children also allows for the introduction of behavioral and nutrition interventions that may be effective in reducing blood lead levels. Lead abatement within the home may both help reduce lead levels and prevent further lead exposure to the patient and to family members.

Subgroups Most Likely to Benefit:

The burden of lead exposure is unevenly distributed geographically, economically, and racially/ethnically. For example, African-American children and low-income children may be more likely to have elevated blood lead levels.

POTENTIAL HARMS

The effectiveness of chelation therapy must be balanced by the adverse effects associated with such treatment, which may include renal, hepatic, hematologic, and gastrointestinal toxicity.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Lane WG, Kemper AR. American College of Preventive Medicine Practice Policy Statement. Screening for elevated blood lead levels in children. Am J Prev Med 2001 Jan; 20(1): 78-82. [40 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Jan

GUIDELINE DEVELOPER(S)

American College of Preventive Medicine - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Preventive Medicine (ACPM)

GUIDELINE COMMITTEE

Practice Guidelines Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: Wendy G. Lane, MD, MPH, Alex R. Kemper, MD, MPH

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Preventive Medicine \(ACPM\) Web site](#).

Print copies: Available from the American College of Preventive Medicine, 1307 New York Ave, N.W., Suite 200, Washington, DC 20005-5603.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on July 19, 2002. The information was verified by the guideline developer on August 29, 2002.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/8/2004

FIRSTGOV

